

# **\*\*ATTENTION\*\***

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## **Spotted Frog**

*Rana prettiosa*

### Range:

Extreme southeastern Alaska to western Alberta, northwestern Wyoming, northern Utah, central Nevada, west to Oregon and Washington (Stebbins 1985).

### Washington Distribution:

Widespread east of the Cascade Mountains. Isolated populations west of the Cascades are currently unconfirmed and could be extirpated; the last verified collection was near Vancouver in 1968 (Nussbaum et al. 1983).

### Habitat Requirements:

Spotted frogs are highly aquatic, inhabiting marshy edges of ponds, streams, and lakes (Nussbaum et al. 1983). Critical aspects of the habitat are not precisely identified, however suitable oviposition and tadpole rearing sites, and refuges for post-metamorphic frogs, especially hibernating adults, are probably critical (Nussbaum et al. 1983, Wells 1977 in Hayes and Jennings 1986).

Adult spotted frogs feed on invertebrates, generally within one-half meter of shore on dry days. During and after rain, they may move away from permanent water to feed in wet vegetation or ephemeral puddles (Licht 1986). Larval frogs feed on aquatic algae and vascular plants, and scavenged plant and animal materials (Morris and Tanner 1969).

Spotted frogs are active in lowland habitats from February through October, and hibernate in muddy bottoms near their breeding sites in winter (Licht 1969, 1975; Svihla 1935). Courtship and breeding takes place in warm, shallow margins of ponds or rivers, or in temporary pools. The same breeding sites may be used over successive years (Nussbaum et al. 1983, Licht 1969).

Female spotted frogs tend to deposit their eggs on top of, or immediately adjacent to, other spotted frog egg masses in an area less than six-tenths meter square. Eggs are laid in water that is only a few centimeters deep, and are usually half-exposed to direct air. Thermal tolerance of embryos ranges between 7° - 28° C (Licht 1971). In marshes near Vancouver B.C., egg laying began in March and was completed by 1 April; metamorphosis into frogs was completed by 15 August (Licht 1969).

### Limiting Factors:

Reasons for the decline of the spotted frog in Washington are unclear. However, introduced bullfrogs (*Rana catesbeiana*) have presumably negatively impacted this species (and, to a lesser extent, other native frogs) through direct competition or predation. Other contributing factors may include habitat alteration, predation from introduced fishes, and susceptibility to toxic chemicals (Hayes and Jennings

1986).

#### Management Recommendations:

Riparian areas and wetlands that support spotted frogs should not be flooded, drained, dredged or otherwise altered. Water levels should not be lowered to avoid desiccating spotted frog embryos and tadpoles by stranding them out of water (Licht 1974). Embryos may also fail to develop if water levels are raised or temperatures are lowered to less than 7° C. Altering the natural flow rate of streams used by spotted frogs should also be avoided.

To maintain adequate cover in wetlands used by spotted frogs, vegetation should not be removed from stream banks or pond edges. In addition to negatively impacting conditions for spotted frogs, removing vegetative cover may raise water temperatures, enhancing conditions for competing bullfrogs.

Introduced fish, such as sunfish and catfish, may prey upon frog tadpoles and eggs. Catfish also disturb vegetation and benthic sediment. Bullfrogs may compete with spotted frogs for resources, and prey upon native frogs during all life stages (Hayes and Jennings 1986). Exotic frogs or fish should not be introduced into sites supporting spotted frogs. Exotics that have invaded spotted frog habitats should be controlled by mechanical means where possible.

Algae, which is eaten by tadpoles should not be removed or treated in wetlands where spotted frogs occur. Muddy substrates, which may be used as hibernation sites, should not be altered.

Several chemical compounds are known to have deleterious effects on Ranid frogs, especially during larval stages of development (Hayes and Jennings 1986). Therefore, pesticides and herbicides should not be applied to waters used by spotted frogs. Urban runoff waters often contain heavy metals and other pollutants that may affect frogs. Stormwater runoff from urban developments should not be diverted into spotted frog habitats.

Rotenone, which affects gill-breathing organisms, is often applied to wetlands to control unwanted fish populations. Rotenone should not be applied to wetlands occupied by spotted frogs during the typical application times of spring and fall, because the young of this species are in the gill stage in spring and do not metamorphose until fall (Bradbury 1986).

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#### Key Points:

##### Habitat Requirements:

- Inhabit marshy edges of ponds, streams and lakes.
- Breed in warm, shallow margins of ponds or rivers, or in temporary pools; the same breeding site may be used in successive years.
- Eggs are laid in water that is only a few centimeters deep and are usually half exposed to air.
- Embryo mortality occurs if water temperature falls below 7° C (45° F) or rises above 28° C (82° F).
- Hibernate in muddy bottoms near breeding sites during winter.

##### Management Recommendations:

- Avoid altering wetlands (e.g., flood, drain, fill, dredge) used by spotted frogs.
- Avoid altering water levels or stream flows during the breeding period (March through August).
- Avoid causing water temperature to fall below 7° C (45° F) or rise above

28° C (82° F) during the breeding period.

- Avoid discharges of heated water or stormwater runoff into wetlands used by spotted frogs.
- Avoid removal of riparian vegetation, or removal or chemical treatment of aquatic algae.
- Avoid introducing sunfish, catfish, other exotic fish, or bullfrogs into wetlands used by spotted frogs; remove these species if they are present.
- Avoid applying pesticides and herbicides to wetlands used by spotted frogs.